

TOBACCO

Curing and Resweating for Quality and
Dark Colors.

A PRACTICAL HAND-BOOK

FOR

CIGAR MANUFACTURERS AND LEAF DEALERS

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CHARLES S. PHILIPS,

Inventor, Author and Publisher,

188 Pearl Street, New York.

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1882.



Chas. S. Phillips

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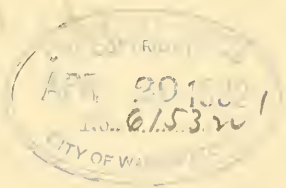
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PREFACE TO SECOND EDITION.

This work is not for the public, but solely for my patrons' use, who have contracted with and who have been Licensed by me to use my Patented Apparatuses and processes, and who are entitled thereby to have the benefit of my long experience in the art of Curing, Sweating and Coloring Leaf Tobacco, and all the aid and assistance I can render them that they may easily and positively reach satisfactory results. As you pay for the knowledge which this book contains, it is to your interest that you do not give it away, but let each person pay for their own schooling. Therefore you will please allow *no one* not connected with your business to have access to it or knowledge of its contents. It is for your private use only during the time you hold a license from me. To inquiring parties who may be interested in the matter, I would be pleased to have you speak of my work in such a kindly manner without going into details as to the process, that you may be the means of my rendering the same beneficial service to others that I have to you. If you should ever do me the favor of showing the apparatus to any inquiring one, please do not inform them as to the degree of heat used on the tobacco either *before* or while it is in the apparatus. Please refer them to me for any information they may wish.

The first edition of this book was too short, not plain enough for some few minds among those whom I licensed. Occasionally considerable correspondence was necessary in order to get them on the right track. As a rule, the people with whom I had difficulty to get them to do nice work, were those who would not read the book, but would write for all sorts of information already laid down in my book, which was in their possession. They simply preferred to read my letters to my book. I have also made new discoveries as to the use of heat on the tobacco while it is being steamed or in the sweating chamber. The tobacco trade is also curing and using newer or younger tobacco earlier each year, as my processes are getting to be better understood. I therefore concluded to re-write and revise the work, and thus kill several birds with one stone.

I have made tobacco my constant study for many years, with a view to improving its quality and sweating it to dark colors; also to perfect processes that

would be simple and positive, and not require extraordinary skill to successfully use them. During these years that I have made the resweating of tobacco to produce DARK COLORS a special business, I have been largely patronized by the leaf and cigar trade in all parts of the land. Many thousands of cases, and large quantities of every kind of seed leaf grown, have passed, and are daily passing through my establishments. I have watched and noted carefully the result of every case. Many costly experiments have been abandoned; prejudices have been slowly overcome. It has been hard, up-hill work, but perseverance will accomplish whatever you undertake; and to-day I have the satisfaction of knowing that I have brought it to such a state of perfection that it is the only successful process in existence, and is in general use from one end of the country to the other, by all classes of tobacco and cigar merchants, from the very largest to the smallest, *and is the only process that will cure and sweat tobacco to dark colors without stinking the tobacco*, and thus making it to a certain extent unmerchantable.

Two great obstacles stood in the way of perfect success. Dead black colors and a stinking tobacco. The tobacco was easily made dark by simply heating the moist tobacco for a few hours or days at a temperature ranging from 175 to 200 or 212 degrees. If the mass to be colored was small, a few minutes or hours was sufficient. If the mass under treatment was one or more cases, the treatment required several days, but the result was exactly the same, so far as color and bad smell was concerned; but the smaller the mass thus treated the better was the general result, for the reason that in masses of 400 pounds or more the outsides of the mass received this high heat from 24 to 48 hours longer than and before the inside of the mass became heated. Consequently, much of the outer portions of all tobacco so treated, became worthless by being burned up as it were by the long application of this high heat, or else the centre of the mass got no treatment at all, which amounted to about the same thing—unmerchantable tobacco, or at best a tobacco of much less value than by the process I now use.

The small steaming apparatuses, used by the small manufacturers, turned out tobacco dark and stinking, but yet without necessarily burning it so as to spoil it for wrappers. The colors were a dead black, void of lustre and the bad odor, empyreumatic or tarry odor, left the cigars to a great extent, after several weeks exposure to air in the boxes. The larger manufacturers who attempted steam sweating or high heat sweating in quantities of one or more cases at a time, ruined large quantities of tobacco. The tobacco stank so thereby that the cigar-makers refused to work it, and cigars made from such stock were difficult to sell, and the cigars were often returned after a sale was made. The demand was

for dark colored wrappers on cigars, yet the trade could not put up with the stink and the dead color. With such a state of affairs then in actual existence, the resweating of tobacco to dark colors had to be abandoned, or a process worked out whereby it could be done with greater satisfaction. The objections *must* be overcome, but how, that was the all important question to me. I found myself with ten thousand dollars worth of sweating apparatuses and machinery for carrying on the business on my hands, that was perfectly worthless if I did not or could not succeed in pleasing my customers in the near future.

I had staked my all, and ruin stared me in the face, but I did not give up. I kept on experimenting, and in three years I spent upwards of twenty thousand dollars in experimenting, making about thirty thousand dollars I had now lost in attempting to so perfect the process that it would be worth a patent. Some said the bad odor came from the metal vessels which they used in which to pack the tobacco for treatment. Some said it came from the wood vessels used. Some steamed the tobacco without having it packed into any vessel at all. Everybody who was interested in the subject tried his or their way to avoid the stink. Some even tried the flavoring or perfuming of the tobacco, but without a single exception they all failed to remedy the evil. Whoever made dark colored tobacco by heat and moisture made it stink. Some tried processes of dyeing the leaf tobacco; others painted their cigars a dark color; yet nothing was satisfactory. The use of dye-stuffs on the tobacco necessitated the large use of foreign matter on the leaf, and the colors were unnatural. If the cigars were painted or colored after they were made, the color was also more or less unnatural, and then if the wrapper became unrolled in the least from the cigar, as it always does when it has been smoked a few minutes, especially the part near the mouth of the smoker, it would at once be seen by the two colors that the cigar had been painted, for that part of the wrapper which was covered up by the lapping over of the outer part of the wrapper would not get any color. Consequently something had to be done in order to change this state of affairs.

I had noticed in my early experiments that the less heat I used on the tobacco the less bad odor the tobacco had, but when I used a heat low enough to avoid the bad smell I did not get the dark color desired. I experimented constantly with every harmless chemical the books made mention of, but still made little or no progress, until at last I found that ammonia gas would remove the stink from the tobacco, and took out my first process patent, making my application February, 1879. I used this process on thousands of cases, but I was constantly experimenting how to avoid the stink during the sweating of the tobacco, as this ammonia gas process necessitated the labor of hanging every case of tobacco in a tight room or box, and the generating of and feed-

ing to the hanging tobacco sufficient ammonia gas to do the work required. This was very expensive, costing me nearly two dollars for every case treated over and above the cost of handling it to get the colors. At length I discovered that the stink was caused solely by the decomposition of certain elements of the leaf while it was under or subjected to a high heat for coloring, also that if those elements could be removed, neutralized or eliminated *before* subjecting the tobacco to a high heat for coloring that the tobacco could then be heated and colored, and it would not stink.

After many experiments I found that fermentation, or first sweating the tobacco under very low degrees of heat, 60 to 90 degrees, or such a heat as will facilitate and not kill fermentation, and continuing the sweating under the low degree of heat for a length of time in proportion to the rank or raw character of the tobacco, that in a comparatively short time the tobacco so treated had lost the bad odor-producing products to such an extent that the tobacco could then be heated and colored and it would not stink. I also discovered about the same time that if the tobacco to be sweated or colored be first wet with a solution of ammonia (preferably carbonate of ammonia), and then sweated under the low heat, that ammoniacal fermentation is set up in a few days, 3 to 6, instead of a few weeks, and not at the expense of the leaf, as is the case in fermenting the leaf by first wetting the leaf with clean water only and depending upon the formation of ammonia enough to carry out the process by its formation from the elements of the tobacco itself. Tobacco thus treated has more strength of leaf than the simply fermented tobacco, and a few days' low sweating under the low heats mentioned, so thoroughly rids the tobacco of its bad odor-producing elements that it may be heated and colored as dark as you wish and yet retain a pleasant and natural odor.

All that is necessary to carry out the process is that you give your tobacco an ammoniacal fermentation for a few days, in any kind of a room that you can warm up to 65 or 75 degrees of heat, and then subject the tobacco-holding vessel to a moist heat of 110 to 120 degrees until the colors suit you, as you will be more fully instructed further along in the book. The reason I then want a moist heat is simply to prevent the tobacco from drying out too fast, to keep up a kind of equilibrium. The tobacco being first made wet and packed into wooden boxes, which are ordinarily tight, will not by the low fermentation lose an excessive amount of moisture, and *no new moisture is necessary to the result*, and by no wood apparatus or process does the tobacco get new moisture while it is in the sweating chamber. If the tobacco be packed into a tight metal vessel, and then subjected to a moist or steam heat, the tobacco will come from the process just as dark, just as sweet, just as nice every way, only the butts of the tobacco

will be too moist, as they could not dry out at all, as all moisture which the heat caused to come from the leaf must naturally follow the course or length of the leaf, and thus condense on or around the butts or ties, thus over wetting them, while in a wooden vessel, under the same conditions as to heat and moisture, the butts would come from the process in a much drier and more desirable condition, as the wood of the tobacco-holding vessel would act as an absorbent, and thus take into itself any excess of moisture caused by condensation of vapor inside or outside of the tobacco holder, and very many days would be necessary to saturate the wood box to such an extent that it could not take up any more moisture, at least many more days than is necessary to conduct the moist part of the process. Tobacco sweated in a factory for immediate use may be sweated as well in an iron or metal vessel, providing the process of fermentation is first properly carried out; but for a jobbing merchant, who may have to keep his tobacco months before selling it, the butts should come from the process not too wet, as they would then mold, unless they were to be sufficiently dried out at once.

No apparatus by itself will do successful work on any seed leaf tobacco *now in the market*. The reason I say that is this: about all of the tobacco now on the market is only about one year old; consequently these tobaccos must be first well fermented under very low heat before they can be heated and colored free of bad smells. A few years ago tobacco was not used until it was two or more years old. Every Summer which it laid in the cases the tobacco fermented more or less, and thus lost some of its rank elements. Had we such old tobaccos to resweat and color to-day, we might wet it and commence the process at ninety degrees, without danger of stinking the tobacco. An apparatus must be guided by both intelligent and experienced hands, and this work is to serve that purpose by directing you how to proceed and giving you my experience; and if you will read it carefully until you are thoroughly familiar with its contents, before you commence operations, and then watch the results of your own efforts, you will not have the least difficulty in meeting with perfect success, and secure results far beyond your expectations. There is no such thing as fail about this process. An apparatus may be ever so perfect, yet to operate it successfully and produce dark, glossy colors, free of bad odors, the operator must have some knowledge of fermentation and the action of high heats on the tobacco. One might as well say of the hundreds of machines now on the market that are perfect in themselves, and that require a special training in order that a person may successfully operate them, that they are not perfect, simply because an ignorant person cannot do the same with them that a properly instructed person can; but when a person invents an apparatus or a machine, and cannot himself instruct others

how to operate it successfully for that which it was intended to do, it must be a very poor invention, and worth little to the public, yet any number of such tobacco-sweating apparatuses have been patented, all claiming some particular merit, yet all of them put together worth nothing.

After tobacco has been cased or wet, then bulked or piled or packed into cases, and left to itself for a few days, it should get warm in the mass, but it cannot get into a heat or sweat, or fermentation, as I call it, unless the atmosphere of the room in which the tobacco is placed be warm enough to induce or start the sweat. Therefore, the moist or wetted tobacco must be placed in a room whose temperature should be at least over 60 degrees. At this temperature it may require several days, say six to ten days, before the tobacco gets nicely warmed through. If the temperature is kept at about 70 to 75 degrees, the tobacco will go into a sweat in from three to six days, and that is quick enough to answer my purpose. Nothing is gained by attempting to force the natural sweat or fermentation beyond that point. You must always bear in mind the fact that so long as the tobacco remains cold in the mass it is not making any progress towards a better quality. It is not throwing off its rank, wild or objectionable elements, as it must do if you wish to get dark colors by the use of low heats, or dark colors and the leaf free from empyrenumatic or objectionable odors or steam smell. As I depend upon fermentation or natural sweat to accomplish this result, and it will not be accomplished so long as the tobacco remains cold, therefore, you must know or find out about the day the tobacco gets into a heat or sweat, and then let the tobacco remain undisturbed in that condition and continue the sweat for several days, or until it has lost its green, raw, rank, wild elements, and smells good and strong of ammonia, before steaming the box of tobacco for colors. To better illustrate the matter, I will say that I case or wet a case of tobacco to-day, stand it on the casing board two hours, then lay it snugly and nicely, without pressing it, into a case or box large enough to hold the whole case. I cover the tobacco with boards, and then set the box of tobacco into a warm room, the thermometer in which shows a temperature of 65 to 70 degrees. I let the tobacco remain there, say six days. I then examine the tobacco by putting my hand down into the tobacco; I find it is cold. I leave it for three days more, and then examine it the same way. I then find the tobacco to be nice and hot, and sweating well.

Thus far I have consumed nine days. Now that it has commenced to sweat I can tell how long it will take to sweat out the rank elements, and fit it for the coloring process, so the leaf may be colored as dark as I wish without producing a bad odor in the tobacco. If the tobacco be of a very fine quality and thin leaf, and NOW smells good, I continue this natural sweating four to six days,

and then put the wood case and all into a steam chamber, and steam it four days at 110 degrees, and then continue the steaming two to four or more days at 120 degrees, or until the colors suit. If the leaf be of medium quality, and does not now smell quite as good as it might, I continue the natural sweat about ten days, and then steam it as before described. If the tobacco be of a rather wild nature, and now has a wild green smell, I continue the natural sweat for about fifteen days, and then steam it as above described. If the tobacco be 3A, 4A, 5A or 6A, Pennsylvania wrapper, or State seed, or Jersey shore, or other leaf of similar character, I continue the natural sweating until the leaf has lost very much of its gum, and has a strong ammonia smell, and also shows already a decided change for the better as to color. This may take fifteen, twenty, or even thirty days before the tobacco is ready for a heat to color it. Only have patience. This class of long leaf is very expensive, and requires more care and natural sweating, and you can well afford to take a little extra time, and thus secure extra fine results.

I cannot too forcibly impress upon your mind the importance of sufficient fermentation before treating for coloring. It means an excellent quality, rich, lively colors and natural odor, fine looking cigars, and if you are dealing in leaf, a larger profit. Fermentation or natural sweat may be hastened somewhat, but you have nothing to gain by it beyond the point to which I have directed you to carry it, and should you attempt to hasten it beyond that point you would be more likely to kill it than to do it any good. It will thus be seen that by following this process dark colors can be produced by the use of only 110 to 120 degs. of heat, instead of 175 to 212 degs., as by the old method of steam sweating, or more properly speaking, the old cooking process. The low heats seem to develop a coloring matter in the leaf which a comparatively low heat brings out. The old process had many disadvantages. The greatest one was that the high heat necessary to produce dark colors killed the oily nature of the leaf, robbing it of its lustre. There is not an objectionable feature about my process, unless it be that it takes more time to now sweat it than it formerly did to cook it.

The several apparatuses and processes which are described in this book are patented, and all persons using any part or all of the same without my license will be prosecuted to the full extent of the law. Any person desiring to use them honestly will be dealt with in a very liberal spirit. I can do you a great deal of good in your business, and all I ask is a fair remuneration for my many years' services and the vast amount of money I have expended in bringing the apparatuses and processes to a scientific perfection, and yet keeping them so simple that any one with ordinary intelligence who will carefully read this book a few times, and be aided by a little practical experience, will be able to proceed successfully on all kinds of tobacco.

Once you understand the principle and necessity and beneficial effect of fermentation, or the natural sweating of tobacco before it is subjected to a heat of 90 degrees, you will then be able to do splendid work, and not until then, so you must first understand how to conduct fermentation. This is done by first wetting or casing the tobacco with clean water or solutions of chemicals, and then piling it in a warm room or packing it into cases, and then placing the cases in a room where the temperature is not below 60 degrees and not above 90 degrees; a medium heat of about 70 to 75 degrees will do excellent work, and a room heated to such a degree is not too hot to work in at any time of the year, and by using my apparatuses and processes that will be the greatest degree of heat your workmen will be compelled at any time to work in. No special room is necessary during the warm weather, and during cold weather you *must* have a warm room for fermenting your tobacco, and it is very important that it should not be heated to over 90 degrees, as the higher heat will dry out the tobacco too much, and other ways do more harm than good. A small stove will heat quite a large room up to 70 degrees temperature. After your tobacco has been cased or wet, it must go into a heat or sweat or fermentation, and remain in that heat or natural sweat several days before it is fit to go into the apparatus or be subjected to over 90 degrees of heat.

The secret of successfully sweating tobacco and producing rich, glossy, dark colors, does not lie in the use of steam or a high degree of heat, but in the proper treatment of the tobacco before a high heat is applied to it, and what I mean by a high degree of heat is, any degree that will kill fermentation, which depends somewhat upon the age or condition of the tobacco. New or uncured tobacco must be subjected only to very low degrees of heat until the raw elements of the leaf have been eliminated, neutralized or destroyed. The safest rule is to commence fermentation at the lowest degree, about 65 to 70 degrees, and slowly but gradually work your way up, only so fast as the nature of the tobacco will admit. So soon as you use a heat high enough to kill natural sweat or fermentation, the tobacco will commence to smell bad, and it will continue to smell worse and worse as the high heat is continued. Fermentation not only makes tobacco smell good, thereby improving its quality, but it also *develops* the coloring matter in the leaf, and it can be carried to such an extent with *sufficient moisture to keep the tobacco from drying out*, that very low degrees of heat will be sufficient to produce very dark colors. Taking these facts into consideration, you will readily see why I lay so much more stress and importance upon first properly and thoroughly fermenting your tobacco, than I do in the use of an apparatus, for if the first is well done, the apparatus cannot fail to do its work; but if fermentation is not well done, the apparatus cannot do what you wish it

to. Unfermented tobacco will stink when it is heated. The heat causes the formation of an oil in the leaf, which is the same as that which forms in an old pipe, and has the same poisonous properties. Fermentation, either natural or chemical, eliminates or neutralizes the elements of the leaf from which the bad odor-producing oil is formed.

I would caution you not to attempt too much at the start in the way of using heat. Do not try to use a high heat simply because you have facilities for producing it. A saturated atmosphere, such as I get in my apparatuses, acts very differently on tobacco from one that is only partly moist or one that is dry; and it is much better that you first get familiar with the low heats, as you will find that by conducting the process carefully many tobaccos need not go into the apparatus at all, except it be for one day or so for the sole purpose of killing and arresting fermentation, so that after the tobacco is colored and is repacked it will not be likely to go into a second sweat which might destroy it. Sweat your first cases after they have been fermented and while they are in the apparatus, as follows: First four days at 110 degrees; then four days at 120 degrees; the last heat may be continued until the colors suit you. Occasionally a case of tobacco may need 140 to 150, or 160, or 170 or 180 degrees for a few hours on the last or seventh or eighth day—for instance, Eastern Havana seed goods. Experience will teach you that, but the heat should not be raised if by so doing the tobacco will be made to smell bad. If the tobacco shows a tendency to smell bad do not raise the heat, as that will surely make it worse. *Always remember that the lower heats with plenty of natural sweating or fermentation beforehand give a natural smelling tobacco, and the most lively, glossy colors. So be careful and certain to continue the fermentation of your tobacco until it has lost all rankness, rawness and all bad smells before you put it into the apparatus for colors;* and when you do put it into the apparatus the tobacco must be in a heat, a good natural sweat. Under no circumstances must you attempt to sweat for colors by applying a high heat to cold tobacco, whether it be first fermented or not.

The principle I work on is that fermentation destroys the elements of the leaf, which cause it to smell bad when highly heated, and in applying high heat the tobacco should first be in a heat of fermentation, and the higher heats then gradually worked up to in proportion, as fermentation may have more or less done its work. The more perfect that fermentation has done its work, that is the longer it is allowed to run its natural course the higher the degree of heat may be used and yet not produce a bad smell on the tobacco, yet fermentation need not go so far as to take too much gum and life from the leaf. When the tobacco has fermented to such an extent that it will not swell on a cigar when

used as a wrapper, and has lost its rank, wild elements to such an extent that dark colors may be produced or brought out by the use of a high heat without producing objectionable odors, then it has fermented enough to answer my purpose.

My main object in revising and re-writing my original book of instructions is to re-write all parts of the work that related to the degree of heat to be used on the tobacco while it is in the apparatus or coloring process, also to more fully instruct my patrons in the art of curing, resweating and coloring tobacco, and to avoid burning it or oversweating it, and the steam smell, Kentucky smell, or bad odor (emphyreumatic) which all steam sweated tobaccos have, which are not sweated by my patented processes. When the book was first written, the tobacco being then resweated was older, had more age than that which is now in the market and being rehandled, and it would stand more heat without injury to it. Each year since the commencement of my resweating business has reduced the stock of old goods very rapidly, until now there is hardly any tobacco used that is but very little more than a year old from the time it was cut from the field; much of it has considerably less age, and as younger tobacco *must be* subjected to a *much lower degree of heat than old goods*, I have each year reduced the heat used upon tobacco to color it until now I have probably reached the minium or lowest temperature. Yet I have endeavored to so instruct you that you can use any temperature necessary to fully and successfully develop any tobaccos you may be called upon to handle.

SIMPLE FERMENTATION of tobacco by wetting the tobacco with clean water will accomplish my purpose provided fermentation is continued long enough, but it very often requires many weeks, and if the tobacco be pretty moist it would be apt to become tender, and if the tobacco be not rather moist the ferment would be apt to become exhausted before the tobacco had become sufficiently sweated. It would then be so dry that another wetting would be necessary in order to continue fermentation, as fermentation can exist only so long as the proper conditions are supplied, namely, heat and moisture. Now, if we look closely into the result of natural sweating or fermentation of vegetable matter, we find that one of its products is ammonia, but in order to produce the ammonia some of the vegetable matter (whether it be tobacco or any other substance) must necessarily become decomposed, destroyed, rotted; therefore, if tobacco be made wet and sweated or fermented sufficiently to produce ammonia from its own elements in sufficient quantity to answer our purpose, it stands to reason that the leaf so treated would be very likely to come from the process in tender condition. Ammonia being a natural product in naturally fermented tobacco it certainly can do no harm to use the same substance on tobacco in imitation of nature's process. I

have found by experiment that *ammoniacal fermentation* can be set up and established as soon as the tobacco has been made wet with a solution of carbonate of ammonia and left in an atmosphere whose temperature may range between 60 and 90 degrees Fahrenheit. So soon as the tobacco gets into a heat or sweat the ammonia permeates the whole mass, removes all rawness and rankness, all wild taste and smell, and greatly improves the quality of all domestic or rank tobacco and without injury to the fibre or strength of the leaf. I also find that the ammonia, being an alkali, saponifies the fats and oils of the tobacco, whereby dark colors are more easily produced and the color and appearance of the leaf is more lively and of a rich, glossy appearance.

This ammoniacal fermentation brings about the desired result in so short a time, compared with natural sweat, that the leaf has not time to get tender; therefore, since the discovery of this very important process, I have treated all my tobaccos by it. It required very many experiments to determine the best quantity to use, as well as the best degree of heat to use. As ammonia boils at 130 or 140 degrees of heat, it is much easier to drive it all out of the tobacco and waste it than to retain it for the proper length of time, or until the colors are as dark as we may wish them to be; therefore, care must be taken that a heat of over 140 degrees be not used, except but for short periods of time, that the ammonia be not entirely exhausted or driven out of the tobacco until the desired shade of color is produced.

Have a little patience. Do not expect to learn all relating to the process on the first cases you try, but study each case, note the results, and make a memorandum, which you can refer to. Be very particular to have all work done in the nicest manner. You cannot put too much labor on your goods; it will all show in the final result. Read this work until you are perfectly familiar with it. Compare results; you will always find something to learn. The more pride you take in it, the better you will be satisfied.

I have endeavored to be so plain in my instructions that you cannot go astray; and I trust I have succeeded in my object. If in any way I have not, you will please be guided by instructions on page 39, and greatly oblige,

Your obedient servant,

C. S. PHILIPS.

SOLUTION FOR CASING OR WETTING TOBACCO.

I find the following solution gives excellent results, and it should be used on all domestic tobaccos. It also works as well on Sumatra, Java and other tobaccos of like character.

Take four (4) pounds of *carbonate of ammonia*, break it into small pieces, and

put into a barrel which holds 45 gallons. Fill the barrel with *cold* water and stir it occasionally until the ammonia is dissolved; then it is ready for use. Do not make up this solution faster than you want it for use, as it loses its strength by standing. It should be made fresh every day or two, and if you are casing only small quantities of tobacco at a time, and several days apart, you can make up a smaller quantity of the solution, say one pound of ammonia and eleven gallons of water, and what you have left after you have done casing, you can keep for future use by putting it in a tight barrel or keg, and put the bung in tight; in this way the solution will keep as long as you may wish. The better vessel to keep it in is a carboy, which is a glass vessel holding ten to twelve gallons and enclosed in a wooden box. They can be had at any drug store at less cost than a ten gallon keg. If you cannot get one, I can send you one. The question will will very naturally arise, "Why do you use ammonia?" and without going into any scientific details, and in as plain language as I know how, I will give you my experience in the matter and show you how you may prove to your entire satisfaction by a few practical experiments, that I am perfectly correct in making the assertion that *ammonia is good for our seed leaf tobacco*. That in no way is it an injury to it. That, as a matter of fact, it is a natural constituent of all well cured tobacco—and that in the proper use of this fact lies the whole secret of producing as dark colored tobacco as you may wish, and of a natural smell and flavor, and without the use of any artificial coloring matter.

There are at least three ways to *impregnate or get ammonia into tobacco*. My old method was to sweat the tobacco as dark as I wanted it, using only plain water casing, and steam heat from 150 to 200 deg. This made the tobacco stink, or have the steam or *Kentucky smell*. I then shook the tobacco out and hung it on pins which were two inches apart. These pins were French wire nails (1½) one and one-half inches long, driven through a half-inch slat, (2) two inches wide and four feet long. The pins or nails were slanted a little when they were driven in, so that when the slat was put in place, the points of the pins pointed a little upward, the slat, being one-half inch thick and the pins one and a half inches long, left one inch to spare on which the hand of tobacco could be placed, The hands were placed on the pins in such a way that the pin went through the tie of the hand. I then used a large tight box four feet wide, six feet high, and ten to twelve feet long; one end was used for a doorway. Four inches from the top of the box, on each side, I had a one-inch strip, two inches wide, the whole length of the box, and another such strip about the middle of the box. These strips are for the four feet slats to rest on. This arrangement allows two tiers of tobacco to be hung the whole length of the box, and it would hold two to three cases of tobacco.

In order that the tobacco should not hang too closely together, a blank slat with no pins on it one inch wide and a half inch thick, and four feet long, was placed between each slat filled with tobacco. This blank slat kept the tobacco slats one inch apart, and the pins being two inches apart, allowed a free circulation of air all around every hand. After I had hung in the tobacco as described, I placed four shallow iron pans, each having one to three pints of aqua ammonia, in various parts of the box underneath the tobacco, and closed up the door and let it hang there over night, and the next morning I packed it into regular cases. The gas from the ammonia water would fill the box and be absorbed by the tobacco, and after this tobacco had been packed a few days, the tobacco would have a good smell; the ammonia having driven all bad smells away. The greatest objection to this process is the expense, as it takes considerable ammonia, and necessitates the handling of the tobacco to hang it up. *The process of hanging has one great advantage, and that is, if fine resweated tobacco is shaken out while it is pretty warm, the leaf is then perfectly free; and if it is hung up in the manner above described for a few hours, and the door of the box left open so the tobacco gets a little air (no ammonia need be used), the tobacco will gain so very much in strength of leaf that many more wrappers may be cut from it.*

Every person who resweats any fine wrappers should build one of these boxes large enough, and have enough of slats with the pins in them to hold at least one or two cases. It will be the best investment you could make. You can then case or wet a fine case of tobacco without any fear, for you know that if it should be too wet to pack at once when it comes from the process, you can shake it out and hang it up in a few minutes, and dry it off just as much as you choose to. A case of tobacco hung up as described, and left hanging over night in ordinary weather—not cold—with the door of the box left open, will lose from thirty to forty pounds of moisture, which is equal to about four gallons of water. The simple shaking out of a hot case, whose temperature in the sweat-room was 140, and at once repacking it, will cause it to lose about fifteen pounds, or equal to two gallons of water.

The second ammonia process I tried was good in its result, but too expensive. The tobacco did not require any extra labor in handling it, but it require more ammonia. The process was simply this: I kept the atmosphere of the rooms or sweat houses constantly impregnated with ammonia gas by feeding ammonia into the rooms or apparatus as often as it was necessary; that was determined by the size of the room, also by the degree of heat used. A pound of ammonia salts or a few pounds of aqua ammonia would last but a very little while. I also had a large retort heat by steam and connected to my sweat-rooms by iron pipes. In this retort I manufactured my ammonia gas and fed it into my sweat-rooms as they needed it and as fast as they consumed it.

The third and last one I tried is the one I first described, that is, the solution of carbonate of ammonia in which I case my tobacco. It has proved cheap and a *perfect success*. The ammonia salts which are dissolved in the casing water, is converted into ammonia gas as soon as the tobacco is heated through; and if the case is pretty tight in which the tobacco is packed, the ammonia gas escapes so slowly that it requires several days to drive it all out, and before it has all gone the colors have become dark enough and the process is ended.

It is *not absolutely necessary that ammonia should* be added to the water for wetting the tobacco in order to have the tobacco smell of ammonia, or show that ammonia is in the tobacco; for if you wet your tobacco with clean water only and pack it away a few weeks, and keep the temperature at 75 to 90 degrees, you will find upon examining the tobacco that it smells strong of ammonia. You will notice also that all the rank, wild elements of the tobacco have disappeared and the tobacco about that time shows its best quality. Ammonia also saponifies or cuts up the oils and fatty substances which were in the tobacco; brightens and *enlivens the colors*, and *leaves no deposit on the leaf*. I have often heard it said that ammonia makes the tobacco gray; that it leaves a whitish or gray powder on the leaf, but such is not the fact. Ammonia leaves no residue upon evaporation. One thing is certain, and that is, tobaccos that do not show the presence of ammonia, are more rank and wild, and are of inferior quality to those that do show it. There is such a thing as tobacco getting *too much natural sweat*, too much ammonia being developed, and that would cause the tobacco to become tender and finally rotten. Therefore the process must be watched. the thicker and more gummy the leaf, the longer it may sweat; while the thin, fine grades need much less time for sweating.

I have before remarked that ammonia is formed in the tobacco while it is undergoing a natural sweat at 75 or 90 degrees of heat. I will here remark that had that same tobacco been sweated by a higher degree of heat, say 110 to 140, no ammonia would have been formed in the tobacco—at least none could be noticed in it—for the reason that the higher degree of heat would drive it out or destroy it as fast as it could be formed. So you will plainly see what a great mistake it is to case your tobacco one day, pack it the next, and put it into sweat the next, at heat above 90 degrees, as it takes several days' natural sweating to produce the ammonia and sometimes several weeks.

If tobacco is put into sweat under high heats, 110 and upwards, before it has been cased with the ammonia solution and before it has sweated naturally a few days under heats from 75 to 90 degrees, or before the ammonia has time to fully develop itself, the tobacco will come from the sweat smelling disagreeably; it will have what is called a steam smell or *Kentucky smell*. This bad smell was

the cause of all the trouble with the previous process, and was, by almost everyone, supposed to be caused by chemicals being used to color the tobacco; but I have shown you that *no chemicals are at all necessary* to make tobacco as dark as we wish. Formerly we did not understand that natural or ammoniacal fermentation or sweat, would drive out and destroy all the wild, rank elements of the tobacco which caused the bad smell. Now that we do understand how to sweat our tobacco sweet and natural in smell and flavor, we have only to follow such simple and natural laws of nature as I have laid down for you to follow, and the closer you follow them, and the more you notice and study the results of each case, the better work you will be able to do and the more pleasure and satisfaction it will give you in doing it.

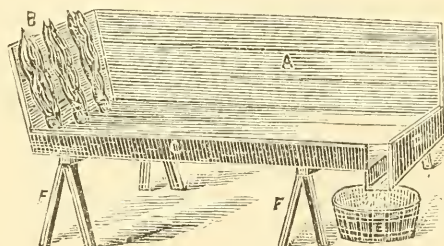
The above are my reasons why I use the ammonia in the water used for wetting tobacco by my process; as *I can thus do as much in a few days as would naturally require several weeks*. I have shown you that ammonia is developed or made under 60 to 90 degrees of heat, and that all heats over and above 110 vaporize it, drive it out, and destroy it. I have also shown you that *ammonia leaves no deposit upon evaporation*; no trace is left behind to injure the tobacco or even show that it had ever been used. So you now know how to make it in the tobacco, and how to get rid of or drive it out, and this latter part is quite necessary, for we only want to use enough ammonia in our casing water to last until the tobacco has sweated long enough to bring out the colors as dark as we may wish. And as this requires heats from 110 to 120, it is very easy to see that the ammonia is very rapidly destroyed, and all the pains possible should be taken to prevent the ammonia being driven out faster than is absolutely necessary. This can be accomplished by *packing your tobacco in tight cases. The tighter they are the less or slower will the ammonia escape, and the sweeter will your tobacco sweat*. You will also learn to graduate the strength of your ammonia solution to suit the nature of your tobacco to be operated upon.

Should you at any time have extra rank tobacco, or that which requires an extra degree of heat, say 150 to 190, like Havanna seed or ground leafy goods, you would need to use a stronger solution, say 6 pounds of ammonia to the barrel of water. You will also see that the *object* is to use just enough ammonia to carry the tobacco through the sweat and have it come from the sweat-room having a natural smell, that is, a slight smell of ammonia. It is better to use the 4 pound solution of ammonia on all goods, and allow the ranker ones more time to ferment than to use a stronger solution of ammonia.

CASING TUBS.

This needs no particular description. It should be at least as large as an ordinary wash tub, and hold at least twenty (20) gallons. It should be large

enough to allow the hands of tobacco to be drawn through the solution in the tub, without the tobacco being forced into such contact with the inner sides of the tub as to break the tobacco. Many tobaccos are so dry that it is necessary to dip them wholly under the water, or holding the hands of tobacco by their butts, dip the tobacco tips first, nearly up to the tie. The casing tub should be of sufficient capacity both in width and depth to allow of the above practice. *The ammonia solution must never be mixed in the casing tub, but always in a separate vessel or barrel, and dipped from the barrel in which it was mixed into the casing tub.* This precaution will always insure a solution of even strength, which is quite important.



CASING BOARD.

The above cut represents a casing board, on which to stand your tobacco after it has been wet by dipping. It should contain thirty-six (36) square feet; the most convenient sizes are four (4) feet wide and nine (9) feet long, or three (3) feet wide by twelve (12) feet long; this will hold four hundred (400) pounds of tobacco (one case) when it is stood upon its heads as represented, only very close together. The side *A* is eighteen (18) inches high, and straight up and down. The headboard *B* is the same height, but slants back a little so the tobacco will not fall forward; the side *C* is six (6) inches high, and is the side on which the caser stands; *D* is a trough to carry the water or casing into the tub *E*. The board rests on two supports *FF*; the back one should be a few inches the highest, to give the board pitch enough to carry any water quickly into the trough *D* and tub *E*.

CASING OR MOISTENING TOBACCO.

It is rather a difficult task to say to what extent tobacco should be wet for sweating without seeing the tobacco to be operated upon, and thus being guided by its needs to fully develop it, and by its nature as to what it will stand, and no one will expect me to lay down an infallible rule. Always stand it up on the

casing board at once, after wetting it. *Never* lay it in piles unless it has first been stood up on the board and well drained off.

If the tobacco be a good, strong leaf, it is a fair rule to bring it back to its marked weight; this can be accomplished by taking the tobacco in your hand by the butts and drawing it right through the water and at once standing it straight up and down on the casing-board as shown in the cut, only close together.

If the tobacco should be very dry and hard, hold the tobacco under the water a few seconds; but if the leaf be thin, fine and large like some of our Connecticut goods, and the tobacco is to be kept for sale, it would hardly be safe to give it so much casing. On such goods it is better to have them run twenty pounds under marked weights than to have them spoil. If the leaf to be sweated shows a disposition to be tender, *and is old goods*, a fair casing will not hurt it, providing you watch it, and *as soon as it gets fairly warm after it is cased*, pack it into your tight case; let it stand forty-eight (48) hours in a warm place, or *until the tobacco gets hot in the case*, or into a natural sweat, and then put it into the sweat room or apparatus. Run it the first day at a heat of 110 degrees, and the second day at 120, and the third day, and until the colors suit you, run it at 170 degrees of heat, being careful not to run it long enough to exhaust the ammonia and make it smell bad.

Should the goods to be sweated be new goods, and show a disposition to be tender, or old goods that are fine leaf and matted so they will not shake out easily, put them, cases and all, in their original condition, into the sweat-room, or apparatus for forty-eight (48) hours at a heat of 140 degrees; this will warm the goods nicely through, and dry the sap out of the new goods, and soften up the old so that they will be very easily shaken out, and all the leaf will be free and made much stronger than before it was warmed up. Now *while the tobacco is hot*, shake it out well and sort out any that is not fit for sweating. Lay out each case by itself, in one pile, say eight feet long, butts all one way; this is done so that the pile will not be too high and heavy, so it will cool quickly, and the butts and tips get nicely dried off. Let it lay another forty-eight (48) hours, by that time the tobacco has got cold, and you can then case it as you think it needs. No tobacco should be wet or cased while it is hot, the pores of the leaf are then open and the tobacco would absorb too much water; neither must warm water or casing be used on tobacco, nor must the tobacco be swung off after dipping or casing; it is only unnecessary labor and does no good, in fact, it does harm by breaking the tobacco. Stand it on the casing board on the heads, and all the water will run off that is not needed to sweat it.

If the tobacco be gummy and fleshy, and only soft enough to shake out

easily, it may be cased by drawing it right through the water. If the tobacco be a red, fleshy, or very light colored leaf, case it by dipping it into the water tips first, nearly up to the tie—one and two A. Pennsylvania goods that are dry or red should always be dipped the same way. Connecticut or other fine long leaf goods that may be too moist to require a “draw through” dip, and yet not moist enough to require being first heated, shook out and dried off before being wet or cased, may be cased by dipping the tobacco into the water *tips first*, so it will be wetted half way or two-thirds way up to the tie, or so far as the leaf is fleshy. Draw the tobacco straight out of the water and hold it in that position a few seconds, to allow the great bulk of the water to run off the tips of the leaf, then stand it on the casing board, when enough water will run towards the tie and butt to wet that part of the leaf sufficiently. Let all tobacco stand on the board two to four hours, so that the water may have a chance to equally distribute itself downwards on the leaf. This will prevent water spots and stains. The tips will also dry off enough, so that they will not oversweat in the cases, but they should not be dry enough to be brittle and break off when they are put into cases. If the tobacco should, from any cause, stand on the board until the tips get too dry, then sprinkle or spray them a little while before the tobacco is to be taken off the casing board. The tip part of the leaf being the more delicate and easily sweated, requires less moisture, and should not go into sweat or be packed too wet.

Many fine tobaccos, especially Connecticut, are very thin, woody and destitute of gum or body towards the heels, butts or tie of the leaf. If such a tobacco should get a butt dip and the thin part of the leaf be made very wet, as it must be in the butt dipping, that portion of the leaf would be the first to rot if left long in the case after it was sweated. This can be avoided in wetting such tobacco by dipping its tips first into the water but allowing only so much of the leaf to go into the water as is fleshy and gummy enough to stand wetting. Draw the hands straight out of the water, and let enough of the casing water run off the tips back into the casing tub *before* standing it on the casing board, so that *not too much* water will run back to the ties while it stands on the boards waiting for the tips to get in order for packing.

Do not be afraid of casing or wetting your fleshy tobacco too much. The standing of it on the board will allow of all excess of water to run off on to the board and back to the casing tub. In casing, take only as many hands of tobacco into your hands for dipping at one time as you can nicely reach around with your two hands. If your tobacco should be dry, or a sandy ground leaf, or a very light colored leaf, or an old dead leaf, the casing should be very heavy, Draw the tobacco right through the water, and regulate the amount of water

you wish to leave on the leaf by the time you allow it to stand on the board, and drain off before boxing or piling it. Such goods will not color unless they be first made wet, to give them new life. If the tobacco should be very dry, so much so that it cannot be shaken out without breaking the leaf, then it should be soaked in the water a few seconds, according to how dry it may be. The danger in re-sweating does not lie so much in wetting it too much, if you stand it up afterwards, as in overheating it and cooking it by using too high a heat. That is what has killed all steam processes of sweating, the tobacco gets cooked without being cured or sweated.

There is very little danger of your casing or wetting your tobacco too much, that is, to go through my process as I have described it. When a case has been sweated enough and has colors to suit you, it then is taken from the process or apparatus, and after laying, say one hour, the tobacco is then shaken out and laid in a pile with the butts all one way ready to be packed again into its original case. This shaking out of the tobacco while it is hot allows a great deal of its moisture to escape in the form of steam or vapor, which was put into it when it was wet or cased. Then, again, if the tips should at this time feel rather too moist, you can dry them off well before packing them by simply allowing the tobacco to remain in pile for a sufficient time. If the leaf should be extra fine and thin, and it should come from the process too wet, shake it out at once while it is at its greatest heat so it will lose as much vapor as possible, then hang up all the hands on pins on slats, as before described for hanging for the ammonia gas process, and let it hang until it is dry enough to suit you, then pack into its case.

Long tobacco should not be taken out of its case and wet and then forced into a case too short for it. I do not like to use a press at all on wet or soft tobacco. Let the packer get into the case and knee it in carefully; this way of packing gives each layer sufficient pressure without pressing the tobacco together sufficiently to force the gum and juice out, and thus avoids matting or sticking together of the leaves.

BOXING OR BULKING OF TOBACCO FOR A SHORT NATURAL SWEAT OR FERMENTATION.

After your tobacco has stood on the casing board long enough for the water to get well drained off, and the tips show that they are drying off, it should then be taken from the board and bulked or piled up nicely, so it will go into a natural sweat. I find it more convenient as well as cheaper, and I get a more satisfactory result, by keeping each case of tobacco by itself. Tobacco certainly sweats better in small quantities than in larger bulks. I therefore take the tobacco

from the casing board and lay it straight and evenly into boxes forty-four (44) inches square and twenty-four (24) inches deep, inside measurement. If you have seed leaf cases and do not wish to go to the expense of these boxes, they will answer as well by building them up fifteen or eighteen inches. This will allow you to put in one such box or case one whole case of tobacco laid in loosely, that is, not pressed down any, only lay it in snugly. Keep the butts close together, so they will *not* get too much air around them, and thus be dried out too much during the few days of natural sweating.

The tobacco should be so laid in that the butts do not touch the wood of the box. The better way to accomplish this is to make a false head-board one inch thick, to stand in each end of the case while you are laying in the tobacco, and when it is all laid in draw out the false head-board. This will leave an air space of one inch between the butts and the case; this will prevent the butts moulding while the tobacco is getting into a natural heat or sweat. The cases should be so handled that the tobacco does not get shook down all to one end. Keep the space always equal on each end of the case. The tobacco should also be laid into the boxes in such a manner as to be a little rounded off on the top. Generally, wrappers are long enough so that the lapping of their tips makes belly enough on the tobacco; but, should the tobacco be too short for that, enough hands may be laid on the tips to round it off a little. The hands should all lay the same way in the box. This prevents the tobacco from water-staining on the tips, for if the tips of the leaves lay lower in the box than the butts, the water naturally runs to the lowest points, and the tips of the leaves require less moisture than any other part of the leaf.

After you have put into a box or case all you intend to, then cover the tobacco with a wood cover; have it made of such a size that it will just fit inside of the case. This will keep the top hands from drying out, and if the tobacco should not quite fill the box or case, the cover being small enough to fit inside will always lay on top of the tobacco, blankets should not be used. They are expensive and soon get filled with mold, and impart it to the tobacco. Now these boxes or cases must be set or tiered in a warm room where the temperature can be kept at about Summer heat, that is, from 70 to 90 degrees of heat for five or six days or *until the tobacco gets into a good sweat and becomes hot all through the mass, and under no circumstances must it be disturbed before.* This allows the water to become more evenly distributed through the leaf; do not try to use more heat at this stage of the process than I have mentioned. It is not necessary that you should try to keep the atmosphere moist while it is sweating naturally under this low degree of heat, as the tobacco is wet and packed in tight cases, and what little moisture the tobacco may lose will come from the butts only and

be absorbed by the wood, and would not be sufficient to interfere with the successful sweating of the tobacco after it is put into the sweat room or apparatus and subjected to a wet heat. In fact, a little drying of the butts at this time is rather to be desired, as the butts and ties should come from the process in not too wet a condition, and if they should get a little dry, they would become moist enough again as soon as the cases were heated through in the sweat room or apparatus, by the moisture working from the tobacco toward and around the butts.

This natural fermentation on sweat determines greatly what the quality of the tobacco is to be, and the longer this natural sweating is allowed to go on undisturbed, the better the quality of the tobacco will become, more especially if the tobacco be Pennsylvania or any other leaf that be heavy, or green, raw and uncured. As soon as the tobacco has got into a nice heat it is ready to repack into regular seed leaf cases. If the tobacco being sweated is in a factory, and for immediate use, the repacking at this stage of the process is unnecessary and may be dispensed with. When the tobacco is taken from the casing board, pack it into cases that have side boards on them high enough so a whole case may be laid in nicely without using a press, cover over with a board cover, let stand in a warm place until the mass gets into a good sweat, then press the tobacco down just enough to allow you to remove the side boards and put on the original cover, then put into sweating chamber soon as it has fermented enough. If it is to be repacked into cases, the tobacco should then be examined to see if the tips are not too moist. If they should be found to be wet the whole case should be shaken out to see that all the leaves are free and in a proper condition to pack for sweating. It should be laid in one pile for an hour or more so the air has free access to all the tips and butts, and until the tips have dried off sufficiently so the tobacco can be packed without breaking any of the tips. If the proper care has been taken to have the tips well dried off before the tobacco was taken off the casing board, this piling of the tobacco before packing will be unnecessary.

The box or seed leaf case into which you are to pack your tobacco before placing it into the sweat room or apparatus, should be made of wood and sufficiently tight so as to prevent steam or hot water vapor from coming in contact with the tobacco. The idea is to protect the tobacco in any way so as to prevent any of it from becoming over saturated or too wet. By a tight wood box, I do not mean that a box need to be made of matched lumber, as an ordinary seed leaf case in good order will answer every purpose, as the wood swells so much as soon as it gets into the wet heat that it is practically tight. Should there be openings in the case not likely to swell enough to come together, cover them over from the inside. The objection to iron, zinc or other metal boxes is,

first they are expensive and the gases from the tobacco destroy them very rapidly; secondly, they cannot be handled while they are hot and wood boxes can be. The process or the result would be the same in a metal box. I have seen it stated that iron or metal boxes in contact with the tobacco tainted it and gave the tobacco a bad smell. Such is not a fact. The tobacco is made to smell bad from overheating it or heating it too long—140 degrees of heat will do so in time—210 degrees will do so in a few minutes.

In packing into cases take plenty of care to lay the hands in very nicely; two to four hands at a time, according to the size of the hands; lay them in very straight, and let the *butt ends come snug up against the head boards of the case* you are packing into. Pack it snugly together; put as many hands as possible in each layer every time you put in a layer across the case. The idea is to pack the tobacco so closely together that the vapor or steam has but very little chance to get around the tobacco. In fact, if the cases are so tight that no steam or vapor whatever can get into them at the tobacco, so much the better; all we want is, such a moist atmosphere around the cases that the tobacco does not dry out. The tobacco has all the necessary moisture from the casing; we neither wish to add to it or take any away, consequently the tighter and more perfect are the cases into which the tobacco is packed to go into the apparatus, the better will be the result. After your tobacco has been packed from the boxes into cases that you mean to put into the sweat room or apparatus, you *must again* let it lay in cases and in a warm place at 70 to 90 degrees of heat as before described, until each case gets heated through again, which will require from two (2) to four (4) days. Now is the time to decide when the tobacco will be fit to go into the sweat room or apparatus.

If the tobacco is well cured and *smells good* and strong of ammonia, it is ready to be finished off in the apparatus; *but so long as the tobacco shows a green, raw and uncured condition and does not smell good, or swells, it must not go into the apparatus, but must be left to a natural sweat until the ammonia has driven out all rankness and a good flavor is established.* If you will give tobacco a little extra care at this stage of the process, follow the rules I have given you and have a little patience. You will be well repaid for all the trouble you may have had by being successful every time. Tobacco cures better under a *low heat*, that is, more gum is thrown out or decomposed by heats of 60 to 90 degs. than by the higher degrees; so if you have a leaf that swells, you must get the swelling out by sweating out the gum by fermentation or natural sweat by using a low heat as above specified. Heats from 120 up to 180 do not throw off any gum, at least not enough to make a swelling leaf burn good during the short time which tobacco can be exposed to such high heats without spoiling the

leaf or its strength. Such heats act more to color the leaf a dark color than to rid the leaf of any of its gum. So you will see why a leaf that has not much gum or none to spare, needs but little natural sweat, and a quicker sweat at the higher heats which bring out the color and which run from 140 to 180.

If a green, raw, uncured tobacco be heated at a temperature of over 90 degrees, or high enough to kill fermentation, and for a sufficient length of time the properties of the leaf will be decomposed, or changed into an oil called empyreumatic oil, which will give to the tobacco a very bad odor, called by the trade steam smell, or Kentucky smell. The same tobacco, if in a moist condition, and placed in a lower heat, say 70 to 80 degrees F., will go into a natural sweat or fermentation, and if left to sweat at that temperature, will soon lose all its rank, green, wild or uncured elements, and the tobacco may then be subjected to a very high heat long enough to color the leaf without stinking it. It is believed that the active decomposing or sweating agent is the oxygen contained in the air which is held in the pores and cells of the tobacco, and which slowly burns up the organic matter contained in the leaf, gum, green, raw and uncured elements which produce the bad odor when heated before they have been eliminated by oxidation or fermentation. All that is necessary to fully accomplish my purpose is that the tobacco be moist and in sufficient bulk or quantity to cause it to heat or sweat, and while in a temperature of about 70 degrees Fahrenheit.

From the foregoing explanation of the action of the different degrees of heat on tobacco, you will very readily see why you should keep enough tobacco cased ahead so as to give it all the time necessary to get it well cured before you attempt to finish it off for colors in the apparatus. No tobacco should go into the apparatus that has not been cased and in a natural sweat or heat from 6 to 10 days. *The better cured your goods are the less time it will take in the apparatus and less expense, and the better will be the result. If you want good, rich, lively colors, you must pay particular attention to the above facts.* It is just as easy to keep a few days' stock cased ahead, as it is for one day. Some tobaccos can be made ready in six days. For instance, fine thin leaf old Connecticut that has no gum to spare, a little experience will enable you to tell exactly all about it. The most particular care should be used in sweating long fine Pennsylvania wrappers. They will not color nicely unless they have been well cased and well sweated before they go into the apparatus.

To satisfy yourself that I am right, you experiment a little this way: After your tobacco has been cased and put into piles or boxes and allowed to remain so for six days, and then packed into cases, you take one case that has been packed three days and put it into the apparatus to finish it off for dark colors and make a memorandum just how many hours it is in the apparatus before it

gets dark enough to suit you. Now take another case that has been packed six days, and then another that has been packed nine days, and you will know how much shorter time it requires the older cases to sweat and how much nicer the colors are than the first case of the lot you sweated. No positive rule can be laid down for sweating tobacco that would apply to all cases. Each one must be handled just according to its own peculiarities. The older the tobacco is the shorter and quicker the process should be; and the newer the tobacco, the slower and longer it should be and the less heat you should use.

When the tobacco has had natural sweat enough to fully develop all the good quality there is in it, and does not smell green or uncured, then put the case or cases into your room or apparatus to be finished off for dark colors, and use a heat as follows: First four days at 110; then continue the process for three or four days at 120; then examine them to see if they are dark enough. If not dark enough then continue at 120 until they suit you. If the tobacco smells good at the end of the sixth or seventh day at 120, and yet not dark enough, and you should be in a hurry for the goods, you may continue the process at 140 degrees. If the goods you put into the apparatus be old ones with no gum to spare, then the process may be carried on somewhat quicker. Run the first day at 110, the second day at 120, and finish off at 160 or 170. Examine the tobacco every twelve hours, or night and morning, while using these high heats, so that the tobacco does not get processed any longer than is absolutely necessary.

HAVANA SEED

should be handled the same as other goods, so far as casing and fermenting is concerned; also while in the sweating apparatus four days at 110, and four days at 120, which colors then very nicely, with the exception of Connecticut or Eastern goods, which require more heat to fully develop them. After they have been fermented and *sweated* for eight days in the apparatus, as above indicated, and do not then show dark enough colors, then finish off all such goods at a heat of 175 to 180 degrees, being careful not to prolong the process more than is actually necessary, as such heats are apt to produce a deadish black color; but if the tobacco be examined often while using such high heats, say every six hours, the darkest colors may be reached and yet have a lively appearance. Great care must also be taken that the tobacco is moist enough to allow dark colors to be produced or brought out. If the tobacco should be too dry, a greyish color will be brought out.

It is very easy to tell whether or not any tobacco is moist enough, by drawing a few hands from the mass under treatment and shaking them out a little

in the open air. If the tobacco almost instantly assumes a harsh and brittle nature, it is too dry to get the colors and there would be no use in further continuing the process; but shake the tobacco all out, let it dry off and case it over again. You will very easily reach the colors the second time. Should you find it necessary or by accident prolong the process to such an extent as to drive out all the ammonia and produce a disagreeable or objectionable smell on the leaf, you can remove the smell by hanging the tobacco and treating with ammonia as before described, or, if the leaf is strong enough to stand it, you can hang the tobacco until it is dried off pretty well and then case it over again, and as soon as natural sweat or fermentation sets in all objectionable odors will entirely disappear, which again proves to you how beneficially natural sweating or fermentation acts upon tobacco, or you can place a few lumps of ammonia in your sweating apparatus, while you are using a very high heat it will cause the room to be filled with ammonia gas and keep the tobacco sweet.

Upon examining any case and finding it dark enough to suit you, you of course take it from the process and set it one side to cool off somewhat; if not dark enough continue the process. But when you put the cases back into the room or apparatus, reverse it, so that the side of the case which was up so far during the process, should now be down, as the side which was up will probably show that it has colored a little the best. This difference will not be quite so apparent where my single case apparatus is used, as the space to be heated is so small, there is hardly if any difference of temperature in the apparatus. *After any case has been finished and standing out of the process an hour or two, it must be nicely shaken out,* then you can at the same time repack it into its original case, if you so wish, as fast as you shake it out. If the tips or butts are too moist, shake it out and let it lay in a pile a little while before repacking it. If you pack it again into its original case, use a false head board as described in boxing the tobacco, also take out one or two head boards from each end of the case and leave them out. This will leave an air space around the butts, and allow them to dry off. Tier these cases in a middle tier, so plenty of air can get at the butts, and keep them from molding. If your tobacco should mold, it is because the air around the tobacco is not dry enough.

After taking tobacco from the process, and shaking it out and repacking it into original cases and taking out the headboards, the cases should be placed for a few days in some place where the air is dry enough to dry out the butts sufficiently to prevent them molding. A little dry heat around the cases for a few days is excellent, but not long enough to throw the tobacco into a second sweat.

Should you have any moldy tobacco and moist, and strong enough to stand it, you put it into the sweat room and heat it 48 hours at 170. This will gen-

erally kill mold, unless the tobacco be dry, then there would be no use in trying it. If you do put the case in to kill the mold, it is to be shaken out and repacked afterwards, the same as the other goods that go into the process. An excellent way to renovate moldy tobacco is to hang it up on the pins until it is thoroughly dry, then give it a good casing, so as to wet all the moldy parts, let draw a day or more, then heat 48 to 60 hours in a moist heat at 140 degrees, then shake out nicely and hang up again, if too wet to pack with safety.

The reason why the tobacco should be allowed to stand some little time to cool off before it is shaken out is, that if at once, in its hot condition, it was to be exposed to the air, it would lose much of its moisture, and the leaf would be inclined to thicken up by the pores of the leaf suddenly contracting. It should be shaken out nicely before it gets cold, as in its warm state every leaf is freely and easily opened by the shaking, whereas, if left to get cold, much of the leaf would stick together and soon be like plug tobacco. In Winter weather no hot tobacco should stand over night without being shaken out. Should a case get cold and sticky, warm it up again at 140 degrees heat, then shake it out.

As a rule, tobacco that has been cased or wet and let lay in piles or boxes and get into a natural heat and then packed into cases, and the cases allowed to stand in a warm place or room at a temperature of 70 to 80 degrees, and sweat naturally for from 5 to 10 days, and then put into the apparatus and heated in a saturated atmosphere for 2 to 4 days, at 110 degrees, and then continued 2 to 4 days at 120 degrees, will come from the process with a *rich, glossy dark color and natural ammonia smell*. If such is not the result, or if the leaf should then be of a red, grey or dead color, or blister when smoked or smells badly, it will be from only one of two causes. Either you did not wet the tobacco enough when you cased it or else you did not let the tobacco ferment [or sweat naturally *long enough in the warm room before* you put it into the apparatus. It is very easy for you to determine which of the two mistakes you made.

If the tobacco becomes quickly dry and husky when you take it hot from the case and shake it in the air, then you did not case it enough, but if it remains moist and stretchy, then any bad or unsatisfactory result is caused by you not allowing the tobacco to sweat naturally under a low heat, long enough before you put it into the apparatus.

You must be patient and allow the tobacco to fully develop its quality under a low heat. We cannot disobey a law of nature without paying for it in some way. You will find that tobacco does not improve in quality in proportion to the degree of heat you may use on it, but that the wild, rank or green elements are destroyed or eliminated more rapidly under a heat ranging not over 90 degs. Therefore it is a waste of time and fuel to put the tobacco into the apparatus

before it has first fermented or gone through a natural sweat sufficient to fully develop it; and every case should be carefully examined before you put it into the apparatus, and if it has any green or raw smell do not put it into the apparatus, but put the case back into the warm room and let it remain there and sweat until it does show a good quality, and then put it into the apparatus and finish it off for colors as before directed.

SWEATING SHORT WRAPPERS.

SHORT A, B AND C STOCK.

The shorter the leaf or the less length there be to it, the less the heat required to produce dark colors. Give them plenty of water, by tip-dipping them, and then give them plenty of natural sweat or fermentation, especially if the leaf be red and gummy. Then try a few days' heat in the apparatus at 110 degrees; then before you use a higher temperature examine the tobacco. The probability is that you will not need to use a higher heat.

FILLERS AND BINDERS.

As a rule, fillers, or binders, or sandy ground leaf goods, should *not* be cased or wet and re-sweated, except for immediate use as soon as they come from the process; they cannot then be kept with any degree of safety: they very easily run into mold and rot unless they be hung up and well dried off after they are sweated, and before they are repacked into cases. This can easily and cheaply be accomplished by making a box with slats and pins drove through them, as fully described under the process for treating tobacco to ammonia gas, in the first pages of this book.

But if you do wish to sweat such goods, and hold them for sale, and do not know just when they will be worked up, the following rules will prove useful: Do not attempt it on new tobacco, that is, goods that are not several months old in their cases; they should be what the trade would call old goods. Do not case them too heavy; as soon as they get warm rehandle them and pack them, and let them stand in their cases, and then put them into process. Sweat them the same as you would short wrappers; when they come from the sweat, be sure you do not pack them too wet; they should be just nicely soft without being wet. Should they feel pretty soft hang them up a little while, as I before described, in the ammonia boxes. The dryer you pack them, of course the more surely they will keep. If you pack them to hold for sale, the cases should be cut down lengthways, so as to make the case narrow enough to allow the tobacco to be packed in with the butts all against the sides of the case instead of the

ends, and the tips just nicely lap on each other; use a false board, as before described, so as to leave an air space between the butts and the wood of the case. Also leave out a side board on each side, so as to allow plenty of air to get around the butts to dry them off.

This mode of packing allows every butt to be exposed to the air, and not to be packed in cross packed, the way most short goods are packed into seed leaf cases, as the hands in the cross packing cannot dry out fast enough, they first mold and then rot, and being in the middle of the case, and lying across the tips and finest part of the leaf of the balance of the case, the whole case very soon has caught the disease and is worthless. Do not cut the case so narrow as to make the tobacco belly up too much in packing it.

Should the leaf be of a sandy ground leaf style or lacking in gum, and 110 degrees not seem sufficient to bring out the colors, the process may be continued at 160 degrees, but examine the goods every twelve hours while under this heat, until they are finished.

HAVANA TOBACCO.

The resweating of Havana tobacco by the use of high heats, is not to be recommended, it does not agree with the leaf, neither does the leaf require it. The leaf is so short that it requires but little heat to develop it sufficiently as the taste for colors in Havana goods runs more in the rich dark brown shades, and these colors may be brought out nicely by natural sweat or fermentation, after being properly cased. In the first place the water used for casing should be soft, for the reason that the coloring matter of the leaf is more soluble in soft water than in hard, and if the water in your vicinity is hard, you should use rain water for casing, or have your hard water treated chemically to render it soft. This can be done at a trifling expense. Rain and snow waters are the purest kinds of natural water. A good water may be known by its being fit for cooking purposes, and it will not curdle soap. If your water is hard it will curdle soap; but if it be soft it will make a lather of the soap.

Some think stagnant water the best for casing tobacco; I do not. Water becomes stagnant on account of its impurities, and they act as ferments. All ferments have a certain life to live like everything else and then die, and I much prefer to use the water fresh, and let all the changes of fermentation take place while on the tobacco; therefore, in casing Havana tobacco, I use fresh or newly drawn soft water. If the tobacco is very dry, dip the whole carat under the water for a second or two, and then stand it on the casing board, tips up, to drain off and soften up. As soon as the tobacco gets soft enough so the strings can be taken off, and the carat loosened out, the hands taken apart without breaking

the leaf, it is then ready to be cased. Now take three or four hands of tobacco in your hands at a time; take hold of them by their heads or butts as they are most generally called, and dip the tobacco into your casing tub, *tips first*, and nearly up to say within one inch of the tie. Now if the tobacco be pretty dry, hold the hands in the water a little, long enough to count one, two, three. If the tobacco should be soft, dip in the hands and draw them out at once, and in either case, when you draw the hands out, *swing off* all the surplus water, and stand the tobacco on the casing board, the same as I have described for seed; enough water will run down on to the butts from the leaf to moisten them all they need. When the tips, in an hour or so, begin to show dryness, then take it from the board, one hand at a time, and pack it straight and snugly into a box made expressly for it. So no butts get covered up in packing it, the same as I described for sweating fillers.

Now that you have it all packed into a box, fit a wood cover down on to the tobacco, press it down with the hands only, so there will be no belly on the tobacco and fasten down the cover. Now set the box in a warm place, as described for the natural sweating of seed leaf. After it has stood for four to six days, examine it to see how it is getting along, and if the tips should be too wet and sweating too fast, pile it all out for an hour or so to let the tips dry off somewhat, and repack it the same as before. The more pains you take to pack it straight and snug or closely together at the butts, the better will be the heel of the leaf sweat and color. The same rule will apply with the same force in packing seed leaf. Havana tobacco is very apt to mold after it is cased, especially old goods that have but little gum and can only be sweated with safety for immediate use. If you discover mold spots on the leaf (and it should be examined for them every few days until it has sweated enough to suit you) you must then put it in your sweat room or apparatus at once and heat it through at 140 degrees, which will require twenty-four (24) hours, then shake it out and use it up, the heat will kill the mold and prevent its further progress or development. Should you wish to sweat it quicker than the natural process, you can put it into your sweat room or apparatus, at 110 degrees of heat. This applies to old goods only, after they have sweated naturally a few days. Should the goods be new, they must sweat naturally until they are well cured before they can be put into artificial heat the same as new seed leaf.

If your Havana be old and of a dead nature and a dull color, and you wish to give it a more lively and glossy appearance, you put into ten gallons of pure or clean water two ounces of pure glycerine, and use this solution for casing. Should your tobacco be very heavy in leaf and so gummy it swells, and it needs a good strong sweat, you can use the following solution to case it in: Water, ten

gallons; molasses, one quart. Any kind of molasses or syrup, or the same quantity of any kind of sugar, will answer the same purpose. The tobacco which this solution is used on must sweat naturally ten or twelve days, then the sweet substance or saccharine matter, you will find, will have wholly disappeared, and acetic acid is then in the tobacco in place of the sugar or molasses, and the tobacco will have a pleasant sour smell; two quarts of cider or cider vinegar, or sour grape wine of any kind, added to the above solution, will give the tobacco a somewhat better smell, but will not improve the tobacco in any other way.

NEW TOBACCO.

I have tried a great many different ways to cure new tobacco, that is, tobacco that has only been dried on the poles after being gathered, and then packed into cases, but I have so far perfected no process that does away with natural fermentation, yet I hope to some time in the future. I do not mean to say I have made no advancement in curing new tobacco, for we can now manufacture the leaf a year or more sooner than was formerly done. Four acres of Massachusetts Havana seed was cut the fore part of September, 1879, hung in the shed, dried, stripped, packed and shipped to me. It was then put into my process, sweated for dark colors and went into the manufacturers' hands and worked up in March, 1880. The plan of procedure, which I can now give you, is as follows: After the tobacco has been gathered from the field and dried in the sheds, stripped and packed into cases a few days, take a head board from each end of the case and place the cases in a room where an even temperature of 70 to 80 degrees may be kept up, this heat may be dry, so as to suck the moisture from the butts and the large middle vein of the leaf. The heat must only be sufficient to keep the tobacco in a natural sweat and dry enough to keep the butts drying out, until the big vein for six inches in the case gets as dry and brittle as a pipe stem. This will take some time, as much will depend upon how heavy the leaf is, and the quantity of green sap in the stem. You will have to decide that after it has been under treatment two or three weeks. You can also tell when you are using too much heat by the smell the tobacco has.

Green tobacco is very easily decomposed by even low heat; it has an unnatural smell—a stink, a Kentucky smell—which you ought to easily distinguish from the smell of natural sweat. So you will see the importance of not trying to force the sweat too much on new tobacco. If you do, you only delay the process; for let the heat get too high and a bad smell once established, you can only get it out again by a good ammonia casing. Even then it takes a natural sweating of many days to wholly get rid of it. You can tell when your

tobacco has sweated this way long enough, by trying the burn to see if it swells, and when it is dry enough, you can tell by the butts and stems. This process will cure the tobacco quickly and thoroughly, and it will keep for any length of time. If you do not intend to resweat it soon, the butts need not get quite so dry, but if you want to resweat it at once for colors, you may then put the cases into the sweat room or apparatus for forty-eight (48) hours at a temperature of 130 to 140 degrees. The atmosphere being wet either by low wet steam or water vapor, the tobacco will thus become soft enough to allow it to be taken from the cases and shaken out without breaking any of the leaves. At the expiration of the 48 hours shake it out nicely, sort out all the poor or "off" hands and pile each case by itself in long shallow piles, seven or eight feet long, with the butts all one way, and let the tobacco lay thus with the tips and butts exposed another 48 hours. It will then have become cold, and can then be cased with the ammonia solution according to its needs, and must then be sweated naturally until all rankness has disappeared, and is to be further governed by the rules before laid down for casing, boxing, packing, sweating, etc. If your goods are a fine, thin texture, you should not, originally, pack them so moist as to make them cure dark and matted in the centre of the case.

If the finest Connecticut tobacco was only packed with less moisture in it, so it would not sweat so much during the warm weather, it would then reach the manufacturers in such a condition that it could be sweated as dark and safely as any other crop, and yield many more wrappers than it now does.

It is not unusual to find 25 to 50 pounds of tobacco in a case of fine wrappers wholly unfit for wrapping purposes, just because they were packed too wet. As a rule, wrapping cases do not yield much more than one-half to two-thirds what they ought to, and all from the mistaken policy packers pursue in packing their goods too wet; so they will sweat hard during the warm months. Of course some of the tobacco in a case sweats dark, but only the middle hands, and they get so tender they are of no use. Tobacco will not stand such long periods of moist sweating without spoiling the leaf. Curing the leaf and sweating for dark colors are two independent processes, and cannot both be done at the same time and bring out a strong leaf.

Manufacturers will some day learn to pack their tobacco in such a manner as to insure the largest yield of wrappers. It is time enough to resweat tobacco four to six weeks before it is wanted for use, and not sweat it six months, and even then have to resweat it before it is of desirable colors. Pack it properly, and then let the sweating and coloring be one continuous process in the factory where it is worked up. There are many manufacturers and buyers of leaf for jobbing and retailing that will only buy such stock as is strong in texture, red

in color, and of a fleshy body. Such goods are the exception, as they are mere accidents. They should be the rule. This class of buyers are getting more numerous as they become better educated in the weed, and packers must conform to their wishes. The less it sweats during its first Summer the less it looses in weight. So also the less it sweats during the Summer, the greater the yield of wrappers when the case comes to be resweated, so it is money in pocket all around.

The packer should not stop to think what color his leaf will be when it is cured, only to cure it in such a manner that the manufacturer gets a strong leaf that he may manipulate it to suit his trade without injury to the leaf. He should pack it in such a state of moisture that when warm weather comes it will go into a sensible state of fermentation or sweat, and thus bring up the quality; but sweating for colors should only be done just previous to its being manufactured. Curing must be a drying process, and coloring a wet process, and so long as the leaf contains moisture it is constantly undergoing a slow decomposition until the leaf dries out enough to stop it, and if the leaf continues moist it must rot.

The sweating, curing and coloring of new tobacco may be commenced very soon after it has been stripped from the stalks and piled or packed into cases and may be one continuous process providing the tobacco is for factory use and to be worked up so soon as it has reached a satisfactory state as to cure and color. There is no good reason why we should wait for warm weather to give our tobaccos a natural sweat simply because our climate is such that we strip and pack it during the cold Winter months. If our climate was always warm our tobaccos would go into sweat so soon as they were packed. We can produce such a climate in our houses or apparatuses very easily and perfectly by artificial means, by having rooms properly constructed and a heat evenly distributed, so that we can use either a dry, wet or moist heat, as we may wish, during the process. If the tobacco is to be simply cured for the market, so as to get it into market early, the process should not be moist enough to leave the tobacco in such a state of moisture that it cannot be kept with safety just as long as we wish to.

It should be done under a very low degree of heat, just sufficient to keep up a sweat or fermentation, and not dry out the tobacco too fast or too much, and so as to avoid the necessity of repacking the tobacco when it has cured enough, for if tobacco be cured by the use of too high a degree of heat or too much moisture during the process, it will settle so closely together in the cases that it would mat and stick together when it became cooled off, and soon become worthless unless it be shook out while it is yet warm, and as soon as the curing

is finished, and thus made free before it got cold in the cases or pile. If new tobacco is to be sweated, cured and colored by one continuous process, the sweating and curing may be done under a low heat and not too much moisture, and as soon as the curing is sufficiently done the heat and moisture may be so conditioned that the tobacco will get the necessary heat and moisture to color it and not dry it out. Either or both processes may be carried on in my apparatuses, but the curing may be done outside and independent of a special apparatus for coloring the leaf, as the necessary conditions for curing are more easily obtained than for coloring.

My patents of April 19th, August 16th and September 13th, 1881, more particularly describe how new tobacco may be treated, and the heats best to use, but after reading this book it will hardly be worth while to refer to them. The main point is to go so slow with the heat as not to develop any unpleasant odors, by first imitating a Summer atmosphere until the tobacco is pretty well cured, and then increasing the moisture of the atmosphere so it will not dry out the tobacco enough to interfere with its coloring, at the same time using a sufficient heat to produce the desired colors. If the curing has been carefully conducted, 110 to 120 degrees will be found sufficient in an atmosphere that is well saturated either by using low steam around the cases or by evaporating water in the lower part of the sweat house or chamber. Either way produces the same result, in the same way and in the same time. It is necessary by either means to use thermometers, so we always know at what temperature the interior of the sweat house is. If steam from a boiler be used for sweating tobacco, a system of perforated pipes in the lower part of the sweat house takes the place of a surface of water, which only acts to distribute the heat over the surface of the lower part of the sweating chamber without altering in the least the nature or condition of the atmosphere which surrounds the tobacco-holding vessel. By either way of sweating the cases of tobacco are simply surrounded by a saturated atmosphere.

Steam cannot exist in a wood sweat-house or apparatus, or any other kind of an apparatus, where a temperature below 212 is used. It is simply the vapor of water, and it makes no earthly difference to the tobacco or the process whether that vapor be generated in the sweating-chamber, or whether it be generated in a hot-water stove or steam boiler, and fed into the sweat-house by pipes. What is wanted is a moist atmosphere and a certain temperature in the sweat-house, which is much below the boiling point of water, and which is indicated by a thermometer on some part of the house communicating with the interior; and if steam from a boiler be used, it is only fed into the lower part of the sweating-chamber in sufficient quantity to produce the desired heat, and so

distributed as to cause the heat to arise uniformly from all the lower part of the sweating-chamber. The perforated pipes should not be too far apart, and the perforations should be small and numerous, and point to or look towards the bottom of the room, and not at once be forced upwards. Heat naturally rises to the highest points of a room, and by having the openings of the pipes empty downwards it insures a more uniform heat throughout a room or apparatus, as the heat is first thrown to the coldest part of the room.

SUMATRA AND OTHER SHORT LEAFED GOODS OF LIKE CHARACTER.

Such goods require a good tip dip all the way up to the tie in ammonia casing to remove the bitter element of the leaf as much as possible. Stand the hands on the casing board to nicely drain off, then pack them nicely in a box narrow enough to just nicely lap the tips without making too much bellying up of the tips. Place the tobacco containing vessels or boxes in a warm room and let fermentation take its course until the tobacco has been sufficiently reduced of its rank elements, then, if you want darker colors, place the boxes in the apparatus, try a temperature of 110 for a few days; then, if not dark enough, try 120 for a day or more. The probability is that if you case or wet the leaf sufficiently in the ammonia solution, fermentation will do about all you wish done unless it be to put it into the apparatus, from one to four days, at a temperature of 110.

In speaking of the time goods are to remain in the apparatus I mean a day of twenty-four hours. It is not absolutely necessary that you should continue the process at a uniform heat, both night and day. When you only run daytime or during working hours you will need to take more time than if you run the heat regular night and day. Keep up the heat into the night as long as you can by making a clean fire about the last thing before closing up for the night, and set your stove damper so shut that the fire will hold all night, even if the heat is not kept up so high as we wish it in daytime. No harm will be done by allowing the heat to go down for a few hours. *But look out that the heat does not go too high.*

Wisconsin or any tobacco that may be saggy and wet, you first heat in the case as before directed for tender or sticky goods, then shake out, dry off, and case as the tobacco may require.

KENTUCKY.

and all such heavy goods need plenty of ammonia water, an extra amount of fermentation, and then if not dark enough, they should be carefully heated.

Ammoniacal fermentation, if moist enough and long continued, often removes the fire cure from tobacco.

NATURAL SWEAT KILLED.

Natural fermentation or sweat is killed or arrested for long periods of time by using certain degrees of heat, or any degree of heat from 140 degrees upwards. This will prove useful to you if you have fine thin goods which needs some sweating, and yet do not need a heavy sweating, and where you want to hold the goods for sale, and do not wish them to continue sweating naturally. I will illustrate what I mean:—Allow that you have two cases of tobacco as near alike as they can be, and you ease them as near alike as you know how, and pack them up. Now in this condition these two cases would sweat all Summer naturally, and before the Winter cold stopped them they would probably be spoiled. but you take one of the cases after it had been cased and packed a few days and heat it through, say 48 hours at 140 degrees temperature, then shake it out and repack it, and place it alongside of the other case, and I can almost guarantee it will not go into sweat again no matter how hot the Summer may be. You now shake out the case you did not heat up and repack it, and in 48 hours you will find it hot and sweating as much as before you repacked it. This applies to old goods. Should the goods be new, and 140 degrees be likely to make them smell bad, use as much heat over 110 degrees as you safely can, and not bring out any bad odor; try 110, then advance a few degrees at a time until you have gone as far as you can, and keep the goods sweet and natural in flavor, and not go over 160 degrees of heat.

Finally, any time you feel in doubt or undecided as to the best course to pursue in order to get the best and most satisfactory results, I would be pleased to have you send me a hand of tobacco drawn from the centre of any such case. I can then return it to you with such instructions as you may need regarding it.

Neither dry off nor moisten any sample you intend for me and pack it up in such a way that it will not dry out while on its way to me. I will then get it in its original condition. Also let me know how old, and what kind of tobacco it is, the marked weight and tare, and reweight; that I may know how much it has lost in weight. This will cost you but very little, and may save you considerable trouble. I am

Your obedient servant,

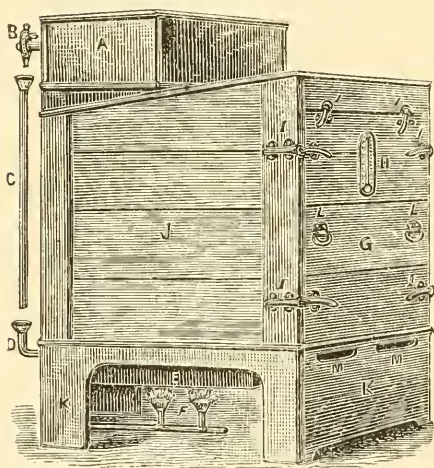
CHAS. S. PHILIPS,

188 PEARL STREET, NEW YORK, N. Y.

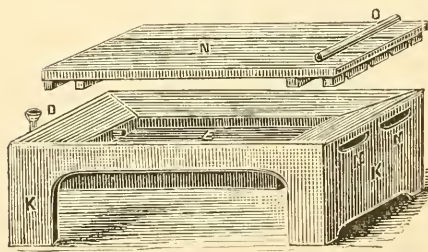
C. S. PHILIPS' PATENT PORTABLE SWEATING APPARATUS.

HEAT BY GAS.

CUT No. 1.



CUT No. 2.



DATE OF PATENTS.

June 22, 1869.

June 16, 1874.

September 26, 1876.

September 18, 1877.

March 12, 1878.

December 9, 1879.

June 15, 1880.

November 9, 1880.

March 29, 1881.

April 19, 1881.

April 19, 1881.

August 16, 1881.

September 13, 1881.

January 31, 1882.

Cut No. 1 represents the apparatus complete, as it looks when in use. It is 4 feet long, 3 feet wide and is 5 feet high, being just large enough for one original case 400 pounds of tobacco, case and all. The roof has sufficient pitch to carry the water of Condensation to the back end of the house and into the pan E again where it first came from, thus preventing the tobacco from becoming wet by the water raining down on to the case from the underside of the roof.

A, is a water tank which sits on top of the house, or it may be placed on a bench on the floor so the faucet B will be over the water pipe D; or the upright part of pipe D may be taken off and a hole made through one side of tank A, and the tank slipped over the horizontal part of pipe D, and a lock nut screwed on it on the inside of the tank so as to make a direct water connection from the tank A to the pan E by pipe D, then the street water may be brought to tank A by iron or lead pipe, and on the end of it and resting in the water in tank A you can place a ball cock or float valve so you can always keep a certain amount of water in pan E. Where you have no street water you can place a barrel of water near the apparatus and pipe from that to tank A, and arrange a float valve the same.

B is a faucet.

C is a pipe to carry the water from B to D.

D is a pipe to carry the water from C to pan E, which is in the bottom of the apparatus.

E is a metal pan in which water is heated and is connected with the water tank A by pipe D and C, and must always have enough water in it so it may be seen from the outside by looking in the tin funnel at D.

F is two gas burners underneath pan E.

G is the door of the apparatus.

H is the thermometer on the door.

I are the six fasteners to keep the door in place.

J is the top part of the sweat house.

K K is the base, 18 inches high, on which the top part J rests, and in which is the water pan E. See cut No.2.

L L are the handles on the door G, by which it is lifted out or placed in position.

M M are air holes from the burners, and around the end of pan E.

Cut No. 2 represents the base of the apparatus K K; with the house J taken off, also the interior construction. E is the pan, D is the water supply pipe for the pan.

N is the floor of the house, which is just over the pan, but in the cut it is raised up high enough to show the hopper shaped bottom around the pan E. This bottom is made that shape as a matter of economy in the size of the steam pan, and also for the purpose of allowing all water of Condensation to run back to the pan where it first came from thus nothing is wasted.

O is an iron roller on the floor N, to roll the case in and out on, and may be left in under the case.

Every apparatus is put together and tested before it is shipped. In setting them up look at Cut No. 1, which shows the apparatus complete; put the tin funnel in the water-pipe shown at letter D. You will find screws for putting the apparatus together and screw holes to match. No nails are used in its construction. Any time the handles do not close the door tightly, turn up the nuts until they do. Between the pan and the wood work is a layer of fire-proof material (asbestos). *Each burner* will consume seven and one-half ($7\frac{1}{2}$) feet of gas per hour when running under high heats, and each large apparatus should have a *one fourth* ($\frac{1}{4}$) *inch service cock*, and where more than one of these apparatuses are in use, there should be $\frac{1}{2}$ or $\frac{3}{4}$ inch pipe from the meter to the $\frac{1}{4}$ inch service cock.

When your gas-fitter sets up the machine be sure and tell him to use a supply valve which has a $\frac{1}{4}$ inch opening *through the valve*. An ordinary gas cock or valve for $\frac{1}{4}$ inch pipe has only $\frac{1}{8}$ inch opening, and that will not give a sufficient supply of gas.

The whole apparatus is built of wood, with the exception of the pans, pipes, handles, etc., consequently it cannot radiate any heat. It is tight, so no vapor can escape, and you could use it in your office and hardly know it, only you could see it. Heat cannot come through wood in sufficient quantity to heat the air outside the sweat-house.

It being portable in every respect, it can be placed anywhere you want to do your work, whether it be in a cold cellar or a hot loft. It needs looking after only once in 24 hours, and runs night and day alike. The heat will not vary after it is once established. To operate the apparatus, you first fill the steam tank A, with water, then open the faucet B, the water will run through pipe C into D, and into pan E. When enough water has run in the pan it will show

itself in the tin funnel which is in the opening of pipe D, then shut the faucet so it only drops into pipe C, or funnel D, about 100 or 125 drops a minute, so as to keep the water always at the same level; now take out the door G, and head your case up squarely in front of the apparatus, and about two feet from it, and so that it goes in on the flat, tip the case over and into the apparatus, so that the case will rest on the roller, now lift up the other end of the case and at the same time push it into the apparatus, then put in the door. Now turn on the gas and light the burners. *Be sure that the burners are only lit at the top. If they should take fire in the round holes at the bottom of the burner turn off the gas and light them over. The top of the burners should be about one inch from the pan.* If the thermometer shows too much heat turn off the gas a little.

It being necessary to examine the tobacco while in the apparatus to find out if it is dark enough, you simply take out the door G, draw the case out about one foot, raise a board of the case, and draw a hand or two. If not done, close the case, push the case back, and put in the door again. Do not interfere with the heat unless the goods are done and you wish to stop the process.

There are three sizes of these sweating apparatuses.

Number One sweats sixty pounds or less. The tobacco may be sweated in the pads or books. For directions see index and article for Sweating in Pads.

Number Two sweats about one hundred and twenty-five pounds in hands the same as when a whole case is sweated at once. For directions see index and article on instructions for using a No. 2 apparatus.

Number Three sweats one whole case at once. The directions and instructions are the same for one case as for two, ten or fifty cases, and you must read the whole book until you master the art.

A small quantity may be sweated in either machine.

As a matter of considerable economy you should keep the steam pan clean. Wash out the inside occasionally, and brush the soot off from the underside. Take off the burners and clean them thoroughly with a good stiff brush. Do not let them get clogged up by the soot which falls from the pan; if the burners smoke and make soot it is because they are burning at the round holes, or you have too much gas turned on. The cleaner you keep all these parts the less fuel or gas will be required to do your work. Place a piece of sheet iron or zinc on the floor under the burners, have it *two* feet wide and *three* feet long. This is to catch any soot that may fall from the pan. Be careful to use clean water in your water tank so the faucet will not get stopped up. Open the faucet wide occasionally for a few seconds, and thus be sure there is no dirt collected in it. This should be done just before leaving it for the night. IN PUTTING A

CASE INTO THE PROCESS, SEE THAT IT IS NOT DONE IN A ROUGH AND CAKELESS MANNER, ESPECIALLY IN PUSHING IT BACK INTO THE APPARATUS AFTER IT IS ONCE ON THE ROLLER, AS IT IS ROLLED BACK VERY EASILY; AND IF YOU LET THE CASE STRIKE TOO HARD AGAINST THE BACK END YOU MAY INJURE THE APPARATUS. Any time the apparatus should not be in use be sure the *steam-pan* and *water-tank* are both full of water and the door of the apparatus closed. This will keep all the parts moist and prevent shrinkage.

In setting up these apparatuses, look first at the cut that you may get a general idea as to its construction, and how it should go together. Now take the two sides and the back end and stand them on the floor of your building, and put screws in wherever you find screw holes; now lay on the roof and do likewise; now take the narrow strip that has the fasteners on and screw that in place in front, as that forms the steam joint over the top of the door; now place this house in the base of the apparatus; lay in the platform on which the case of tobacco is to rest over the steam pan, then put in the door. You will notice that the door fasteners bind on the wedge shaped irons on the door, and if they do not shut the door tight enough you can turn the bolts in their nuts until they do. Each part of the apparatus is marked or stenciled which side goes up, back or front; set the apparatus where drafts of cold air cannot interfere with the flame of the gas. The warmer you can keep the surroundings the less gas will be consumed. WHEN UNBOXING THE APPARATUS SC AS TO SET IT UP, DO NOT REMOVE THE THREE-CORNERED PIECES WHICH ARE ON THE BOTTOM OF EACH CORNER OF THE APPARATUS; they serve as supports, so that only the four corners rest on the floor, thus overcoming any inequalities of the floor.

HOW TO USE THE No. 1 APPARATUS.

SWEATING IN PADS OR BOOKS.

Case or wet your tobacco the same as I have directed for casing whole cases; pack it away for a few days, then strip, sort, and pad. Put all the different kinds of leaves by themselves in separate pads; see that they are all quite moist. If any should be too dry you should sponge them over as you book the leaf. The lighter the color the more you should moisten the leaf. Have several small, *tight* wooden boxes made that will fit into the apparatus, about like the one which came with the apparatus. Into these boxes you tightly pack your pads of tobacco. If you have not enough pads to fill the box, then make a wood cover that just fits inside the box, and lays on top of the tobacco. On the top of this

board put a few pounds weight. Now set the box of pads in a warm place for a few days—five to ten days. If the tobacco be gummy and raw, or rank, make it ten days, then put the box of pads into your apparatus, and follow directions as to heat the same as for larger quantities, but not for such long periods of time. Keep enough tobacco cased, stripped, and padded ahead, so that each box of pads gets the ten days' fermentation. Read the whole book until you are master of the art.

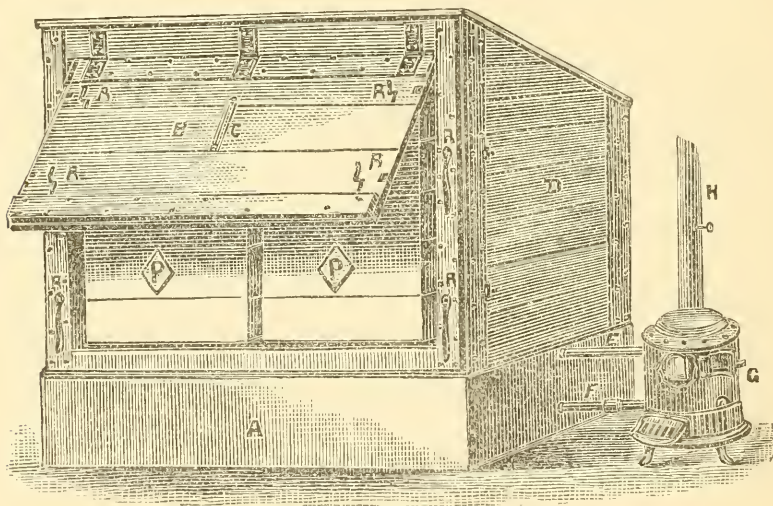
HOW TO USE THE No. 2 APPARATUS.

Proceed exactly the same as if you were sweating one or more whole cases at a time instead of a small case of 125 pounds. Have several boxes made like the one that came with the apparatus so that each box gets the necessary natural sweat or fermentation ; you will want five or six of the boxes. Case your tobacco and stand it up to drain off as before described, then pack it nicely into your small boxes and set the boxes in a warm room or place where the tobacco will get hot in a few days, let them stand 5 to 10 days after the tobacco gets hot, then, *without repacking it*, put the boxes of tobacco into the apparatus to finish off, using heat as before directed for larger quantities, only such a smaller quantity will generally color in less time than one case will.

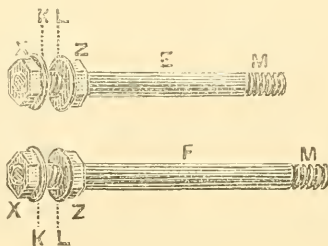
Read the whole book until you are master of the art. If you do not master it, it will be because you have either not read the book enough, or not understandingly. You cannot fail if you follow instructions.

C. S. PHILIPS' PATENT SWEATING APPARATUS FOR ONE OR MORE CASES,

heat by a hot water heater or steamer. Cut No. 1 represents an apparatus for sweating two cases at a time. Cut No. 2 represents the pipes which connect the heater with the water supply for the stove.




CUT NO. 1.



CUT NO. 2.

I manufacture this style of apparatus in four sizes :

No. 1. Sweats every six days one whole case of seed leaf at a time, in its own case, or 400 pounds of tobacco. The apparatus is like cut No. 1, only it holds only one case.

No. 2. Sweats every six days two whole cases at a time. The cases lay side and side of each other, as represented by  in cut No. 1. The apparatus takes up a floor space of four feet wide and six feet long.

No. 3. Sweats three cases at a time in six days. The cases lay side and side of each other, the same as represented in cut No. 1. This apparatus takes up a floor space of only four feet wide by eight and a half feet long.

No. 4. Sweats four cases at a time in six days. The cases lay side and side of each other, the same as seen in Cut No. 1. This apparatus requires a floor space four feet wide by twelve feet long.

A one-case apparatus sweats one case per week.

A two " " " two cases " "


A three " " " three " " "

A four " " " four " " "

And so on up for any size of apparatus.

They are all made of one and a half inch pine, and the best the market affords, and will stand several years' constant service. Every part is bolted or lag-screwed together, so that, any time it is necessary, any one piece or part of the apparatus may be renewed without difficulty.

Cut No. 1 represents a two-case apparatus complete. A is the base part, 24 inches high, about 4 feet wide and 6 feet long. This base is entirely independent of the house part of the apparatus, and removable from it. Two inches from the top of this base A and inside, is a flooring covered with lead to make it water and steam-tight, so as to catch and carry off all condensation.

B is the door which opens upwards on hinges, and is shown partly open, partly exposing two cases marked each .

C is a thermometer on the door B, which communicates with the interior of the sweating chamber.

D represents the house part.

E and F are the two pipes which connect the hot water heater to the apparatus, and a small cold water supply tank in the end of base A, opposite the pipes E and F, in which is a float valve for automatically supplying the hot water stove and always keeping it full of water. The float valve may be connected to your hydrant or a tank in your factory. The ends M M screw into the holes in the hot water heater. The pipe E is the longer one of the two and

goes into the *top hole* in the side of the stove, and pipe F in the bottom hole in the side of the stove. X Z and K L are iron nuts and rubber or gum washers, for forming water and steam-tight joints with the sweat house base.

G is a small steamer or hot water heater, the object of which is to vaporize the water and throw it into the sweating chamber, where it will surround the case of tobacco, and the water of condensation is returned back to the heater by the tight floor in the base A, but no water is to remain in the bottom of the sweating chamber. The better way is to constantly allow condensation to go to the sewer or cess-pool or other place of waste, and thus no dirty, contaminated water goes back to the stove.

H is the stove pipe, which is 4-inch pipe, in which is a damper for regulating the heat in the apparatus.

DIRECTIONS FOR SETTING UP THE 1, 2, 3 AND 4 CASE APPARATUSES AND HOT WATER STOVE.

The first thing you do after getting the apparatus into your house is to unbox the stove ; then remove all the blocks and strips that were nailed on to the woodwork of the apparatus in crating or boxing it for shipment. You will find the pipes and dampers, etc., boxed in the underside of base A.

DO NOT REMOVE THE THREE-CORNERED PIECES WHICH ARE ON THE UNDER FOUR CORNERS OF THE BASE A, AS THESE PIECES ARE PUT ON TO FORM SHORT LEGS FOR THE FOUR CORNERS TO REST ON TO COMPENSATE FOR ANY UNEVENNESS OF THE FLOOR ON WHICH THE APPARATUS IS TO STAND.

Remove everything from the lead-lined base A *except* the frame of one-inch stuff which is inside on the lead and around the out edges on which is fastened the support for the floor on which the cases are to rest. This frame of wood is to allow the house part of the apparatus to rest upon it instead of resting directly upon the lead, as the lead might thereby be cut through and caused to leak. Then place the hot water stove at the *right hand* end of the base A, as shown in Cut No. 1, or opposite to that part of base A which has the water supply tank and float-valve in it. You will find two pieces of one-inch pipe corresponding with pipes E and F, Cut No. 2 ; the longest one screws into the top hole in the side of the stove, the shortest one screws into the lower hole in the side of the stove. Screw both these pipes firmly into the stove by their ends M M. On each of these pipes, E and F, you will also find two lock-nuts, X Z, also one iron

washer, L, and one gum washer, K. Now take off the nuts X X and the gum washers K K, *leaving on the pipes the nuts Z and iron washers L*; then move the stove up against or towards the base A, so that the pipes E and F will enter the holes and go through into the tank where the float-valve is, but do not push the pipes any farther into the tank than is necessary to replace the nuts and washer. Now slip over the ends of the pipes the gum washer K, and screw on the nuts X X only just far enough, so that the ends of the pipes are just flush with the outside face of the nuts. Now, on the outside of the base A you set the iron washers L L up against the wood of base A, and then screw up the nuts Z Z tight enough to make water-tight joints.

Do not use a wrench on the nuts X X after they are once in place in the tank, as by turning them up you run great risk of spoiling both the gum-washer and cutting the lead. You must get tight joints by drawing nuts X and Z together, by turning up only on nuts Z which turn on the face of the iron washer. You next connect your stove with your chimney, using *four-inch pipe*, also a damper H which I send you, then connect your street water-pipe to the float valve pipe by way of the half inch pipe which just projects from the float valve through the base A. If you have no water system in your town or in your building, you make a stand a few inches higher than base A of the apparatus, and on it place a 45 to 60 gallon barrel or tank for holding water, and from near its bottom you take out a half inch pipe and connect it to the float valve pipe; now pour water in the barrel or supply tank, and let it run into the base of the apparatus until the float valve closes itself and shuts off the water, which it should do *only* when the stove has become filled with water and the small tank in base A has also become filled, until *the water covers the top pipe from the stove and it is one and a half inches under water. But the water should not overflow and cover the whole or any part of the lead bottom of the sweat house.* Water should *only* be in the small tank, and you must see that the float valve does not close off too soon, as *the stove must always be full of water.* The float valve is tested and adjusted before shipping, but during transit it is possible for it to get out of adjustment; you can easily readjust it by slightly turning the elbow on the pipe or carefully bending the arm or lever on which is the ball. Having faithfully attended to all the foregoing, and found the stove and base A water-tight, you are now ready to place the house part into position.

You will find the various pieces stenciled as to where they belong. Thus: ROOF FRONT, END OUTSIDE, which means that the part so marked is the roof and goes to the front of the apparatus (which is the door), also, it is to go that side out. The ENDS, BACK and FRONT are also so marked. The edges that are to go UP are stenciled, THIS SIDE UP, so by looking at the cut you

cannot have much trouble in setting up any sized apparatus. YOU FIRST SET THE BACK PIECE AND TWO END PIECES INTO BASE A AND ON TO THE INCH BOARD, THE WIDE EDGES OF THE END PIECES TOWARD THE FRONT, and fasten them together by putting in the lag screws wherever you find holes, USING THE LONGEST SCREWS, and screwing them up tightly with a wrench; but BEFORE PUTTING IN ANY SCREWS BE SURE AND SLIP A WASHER ON THE SCREW, SO THE HEADS WILL NOT DRAW SO MUCH INTO THE WOOD. Then lay on the roof and do likewise. Now remove the iron fasteners and bolts from the doors or front of the house and set the front into position in base A, and then put in again into their respective holes in the door fasteners and bolts and turn them up tight. *Turn the door handles in their nuts* until they close the doors tight enough. Get on the roof of the house and put in the lag screws along the front edge down into the front piece wherever you find holes; also put in lag screws into the holes in the hinges which now have none; now *open your door or doors and lay in the one and a half inch flooring*. It need not be tight together. You are now ready to *fire up*. Start a fire in your stove and run it a few hours before putting in any cases, so as to see if all is right. Should the doors leak around the top edges or corners slack up the bolts of that part of the hinges that are ON THE DOOR and slip under a piece of tin or cardboard and set up the nuts again. See that your float valve feeds the water into the tank as fast as it is evaporated by the stove. Then you can put in your cases. You will find a piece or pieces of iron piping to use for rollers, lay them on the *front edge* of the floor of your apparatus; *head your case* up in front of the apparatus *on a truck*, and tip it over on to the roller and push it *easily* into the apparatus; do not let the case strike hard against the back of the apparatus.

You can leave the roller in under the case while it is sweating, but if you find that the underside or down side of your cases *sweats too quick or too much*, you may leave the roller out, the heat then having to come through the thick floor will not so quickly or roughly affect the tobacco. You will probably not notice much difference unless you should find occasion to use over 140 degrees of heat, then you had better leave the roller out during the sweating, or during such time as you may be using a high heat. The water in the stove and tank will get dirty by use; it should be cleaned out quite often and filled with clean water. In regulating the heat in the apparatus you can do so by the dampers in the hearth and stove pipe. To run with a low heat, shut the dampers in the stove and stove pipe *all up tight*. If you then cannot run low enough, you can leave the stove door open a little. With a little practice and experience, you can run at any heat you wish. To increase the heat, you open the damper in the stove

pipe a little. If the pipe damper be wide open and yet not heat enough, then open the hearth damper enough to meet the requirements. In fixing the stove so as to carry the heat as far into the night as possible, it is not necessary that a high heat be carried all night. If the heat is sufficient to keep the tobacco sweating, that is enough. Then carry it higher through the day, that is if you should be sweating daytimes with over 120 degrees of heat. If you are not using a higher heat it is quite easy to keep that heat night and day. Clean your stove out nicely late in the afternoon; put in plenty of clean, hard coal, not too large (stove and nut mixed is best) giving it draft a few moments, then close all the dampers up tight and leave it until morning.

THE ONE CASE APPARATUSES HAVE NO FRAME OR BOARDS AROUND THE INSIDE OF BASE A, ON THE LEAD. THE BATTENS ON THE OUTSIDE OF THE HOUSE CAUSE IT TO REST ON THE SIDES OF THE BASE A.

For larger factories I build larger apparatuses, which will sweat at one batch six, eight, ten, twelve, twenty-four, forty-eight or more cases. The processes and apparatuses are the same, with the exception that in the large apparatuses I tier the cases two high. I always advise large dealers or manufacturers to build their rooms this same shape, as it allows of sweating any number of cases without any person ever working in heated rooms, which has been the means of the death of many employers and employees. As almost every large apparatus requires some different mechanical arrangements for heating and setting them up, I do not in this book attempt to go into the subject, but give special instructions with each apparatus. It is easy to determine how much room any apparatus would take up by simply measuring any number of cases tiered two high and lying side by side of each other. As any apparatus will turn out a batch of goods or the apparatus full of cases about once a week, you can easily determine how large an apparatus you need. For instance, a six, eight, ten or twelve-case apparatus will sweat six, eight, ten or twelve cases per week, and so on up. Do not fail to write me for any information you may wish.

I am your obedient servant,

CHAS. S. PHILIPS,

188 Pearl Street, New York.

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